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Brooks researchers study Charleston AFB's crew rest to optimize performance

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CHARLESTON AIR FORCE BASE, S.C. — Crews from each of Charleston Air Force Base's active duty airlift squadrons are undergoing sleep research in hopes of finding the perfect sleep schedule for future missions.

Researchers from the Air Force Research Laboratory at Brooks Air Force Base, and the Air Force Operational Test and Evaluation Center, Kirtland Air Force Base, N.M. are conducting the sleep research during real-world missions flown by the 14th, 15th and 17th Airlift Squadrons.

Dr. Bill Storm, a senior research scientist for AFRL, said sleep research for the Air Force is not new. The Air Force has been conducting sleep studies for more than 25 years, and Storm worked with Charleston C-141 crews in the 1970s and 1980s.

He said the reason for his latest visit is to look at a new software program called the Fatigue Avoidance Scheduling Tool (FAST).

"FAST allows us to take the work schedule of a security force or pilot and compare it to their sleep schedule," said Storm. "We can look at particular mission and say, 'Here's what time the drop is. If you take a nap at this particular time in the mission, you'll be at your maximum performances capability for the drop.'

"Seldom can we say, That's a bad time to bomb," said Storm. "My philosophy is that any sleep is good sleep. However, there are certain times during the duration of a long mission when you'll get a more restorative sleep."

Knowing when a person needs sleep and when they will be at their maximum performance level is based on the Circadian Rhythm, according to Storm. Everyone has a Circadian Rhythm, or body clock, that runs for about 24 hours. At about the 18-hour point of being awake, a person will start to experience performance deficit.

"At 18 hours, you'll start feeling tired, like you need sleep," Storm said. "There's a reason for that. Your Circadian Rhythm is on the downside. You will start having reaction time problems, and if you stay awake that whole first day, your performance will drop by 20 or 25 percent."

A person needs 7.5 to 8.5 hours of sleep every night, according to Storm. He said a lot of people get by on six hours regularly, and because of the lack of sleep, they're not performing at their maximum level.

Oversees missions also greatly affect the performance of aircrews because of the difference between a crew-member's body clock and the cultural clock for the area they may have to fly to.

According to Storm, it's not practical for an aircrew member to try to pre-adapt to a new area's cultural clock. For instance, it would take a person about six days to prepare their body clock for Germany's cultural clock (about one hour of adjustment per day.)

Since most crews don't have six day's notice, and since adjusting a body clock involves things like black out curtains, Storm said it's best just to get as much sleep as possible before departing home base.

The FAST software being studied will account for things like sleep attained prior to departing home base. Storm said the sleep schedules of the aircrews being studied are recorded prior to leaving for a mission.

During the mission, crewmembers wear actigraphs, watch-like sleep monitors, to record the times when they are asleep. When the crews return, information from the actigraphs is downloaded into the software.

"Pilots are also completing a vision reaction time test three or four times each day," said Storm. "The test is very sensitive to tracking sleep loss."

Continued on page 2

Continued from page 1

Currently, a researcher is flying with each of the crews to help measure sleep patterns and recommend prime times to nap. Storm said the researchers are traveling with the test crew as they fly to Germany to take part in Operation Enduring Freedom missions.

Eventually, Storm would like to see all the research pay off in the form of user-friendly software that flight-planning officials can use while scheduling missions. @

(Note: Dr. Bill Storm, world-renowned sleep researcher at Brooks Air Force Base, retired July 3 after more than 32 years of civil service.)

This story first appeared in Brooks Air Force Base Newspaper, Discovery.